REMARKS

This application contains claims 1-22. Claims 1, 8, 9 and 18 are hereby amended, and claims 19-22 are added. No new matter has been introduced. Reconsideration is respectfully requested.

Claims 1-4, 9-13 and 18 were rejected under 35 U.S.C. 103(a) over Arnold (U.S. Patent 5,929,866) in view of Okada (U.S. Patent 5,852,468) and Koga et al. (U.S. Patent 5,848,185). Applicant has amended independent claims 1, 9, 10 and 18 in order to clarify the distinction of the present invention over the cited art.

Arnold describes a method for processing a character for anti-aliased display on a raster output device. The method is directed to scan-conversion of outline font characters for rendition as density maps. For characters having edges that are not aligned with the raster of the output device, the edges in the displayed image may have a jagged appearance, which is referred to as aliasing (col. 1, line 55 – col. 2, line 35). Arnold's method aims to avoid this sort of aliasing by adjusting the density value of each pixel by blending a foreground color and a background color (col. 2, lines 59-64). The foreground and background colors are predetermined by the capabilities of the output device in question (col. 1, lines 43-54). In other words, Arnold's method is directed to taking a predefined character, having sharp geometric edges, and adjusting the density values of the pixels near the edges by blending predefined foreground and background colors in order to give the image a more pleasing appearance.

Okada describes a one-chip color video camera, in which color signal components are generated by interpolating primary color signals from neighboring pixels. In this manner, color signal components are determined for each 2x2 pixel block, which contains red, green and blue pixels (abstract).

Koga describes a method for image processing based on extracting image
segments from an input color image (abstract). The segments that are extracted have
different characteristics from background segments in the image (col. 3, lines 54-60).
Although Koga may be taken to describe determination of background color, he does
not describe or make use of any sort of determination of a non-background color.

Claim 1, as amended, recites a method for electronic imaging based on an
image that is formed on a color mosaic image sensor. Such a sensor has, for each
pixel, a filter of a certain color that filters the light that is incident on the pixel. Based
on initial signals received from the pixels in the image, background and non-
background colors of the image are determined. For each pixel these color
determinations are used <u>in conjunction with the respective color of the filter
associated with the pixel</u> in order to calculate an adjusted pixel signal. In this
manner, the resolution of the image may be enhanced significantly, compared to
conventional mosaic sensor systems in which luminance and color are determined
only with respect to a group of pixels taken together (see page 4, lines 30-33, in the
specification).

The object of the invention recited in claim 1 is opposite to that of Arnold:
Whereas the method of claim 1 is directed to processing <u>input signals</u> received from a
mosaic image sensor, Arnold is directed to enhancing features in an <u>output image</u>.
Arnold assumes the features in the output image to have predefined geometric shapes,
and is indifferent to how the image features were originally captured. He makes no
connection between his rendering methods and any sort of physical phenomena
associated with image capture by an image sensor. The method of claim 1, on the
other hand, deals with an unknown image, and makes use of specific qualities of the
image capture device – the colors of the filters associated with the pixels – in order to

enhance the image. Thus, despite possible semantic similarities between elements of claim 1 and Arnold's methods, the methods are substantively very different. Since Arnold is concerned with output devices, rather than input devices as in claim 1, it is clear that Arnold cannot be taken to teach or suggest the use of mosaic filter colors in calculating adjusted pixel signals.

Furthermore, because <u>input devices play no role at all in Arnold's system</u>, a person of ordinary skill in the art would not have been motivated to apply an aspect of an input device, such as the filter colors in a mosaic image sensor, in order to enhance Arnold's method. Therefore, even if the other cited references could be taken to teach the use of mosaic image sensors and processing of images made by such sensors, the person of ordinary skill could not have introduced these teachings into Arnold's method in order to arrive at the method of amended claim 1. Thus, claim 1 is believed to be patentable over the cited art. In view of the patentability of claim 1, claims 2-4, which depend from claim 1, are believed to be patentable, as well.

Claim 10 recites apparatus for electronic imaging, which operates on principles similar to the method of claim 1. This claim has been amended in like manner to claim 1. Therefore, for the reasons stated above, claim 10 is believed to be patentable, as are claims 11-13, which depend from claim 10.

Claims 9 and 18 respectively recite a method and apparatus for electronic imaging. These claims are similar to the method and apparatus of claims 1 and 10, but add the limitation that the image comprises multiple areas, each with respective background and non-background colors, which are used in determining the adjusted signals. These claims have been amended in like manner to claims 1 and 10. Therefore, for the reasons stated above, claims 9 and 19 are also believed to be patentable.

Claims 5-8 and 14-17 were rejected under 35 U.S.C. 103(a) over Arnold in

view of Okada and Koga, and further in view of one or more of Loushin (U.S. Patent

6,462,835), Kamada et al. (U.S. Patent 6,347,156) and Hertz et al. (U.S. Patent

6,366,696). In view of the patentability of claims 1 and 9, from which these claims

depend, claims 5-8 and 14-17 are believed to be patentable, as well. Although

Applicant believes these dependent claims to recite subject matter that is

independently patentable over the cited art, the independent patentability of these

claims will not be argued here for the sake of brevity.

New claims 19-22 have been added to recite additional novel aspects of the

present invention. These claims, which depend from claims 1 and 10, recite details of

the method used in determining the adjusted signal: In claims 19 and 21, first and

second relations are determined between the mosaic filter colors and the background

and non-background colors of the image. These relations are then applied to the

initial signal in order to determine the adjusted signal. Specifically, as recited in

claims 20 and 22, the relations are used to determine multiplicative factors, which are

applied to the initial signal at each of the pixels in order to determine the adjusted

signal. Calculation of such relations and multiplicative factors is illustrated in the

specification in equations (4) and (5), for example, and is described with respect to

these equations and to Fig. 5.

These methods of signal adjustment are not suggested by the prior art.

Specifically, none of the cited references describe a method for calculating an adjusted

signal for <u>each pixel based on the color filter of that pixel</u>, wherein a correction

determined by the color of that particular filter is applied <u>individually to each pixel</u>.

In contrast to the present invention, processing methods known in the art for use with

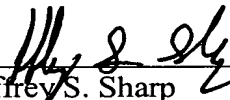mosaic image sensors combine the signals from multiple pixels in order to determine

luminance and chrominance values. Thus, claims 19-22 are believed to be independently patentable over the cited art.

Applicant believes the amendments and remarks presented hereinabove to be fully responsive to all of the grounds of rejection raised by the Examiner. In view of these amendments and remarks, applicant respectfully submits that all of the claims in the present application are in order for allowance. Notice to this effect is hereby requested.

Respectfully submitted,

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